Title: ChatGPT and Generation 'Z': A Study on the Usage Rates of ChatGPT

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ChatGPT and Generation 'Z': A Study on the Usage Rates of ChatGPT

Abstract

The objective of this study is to determine the influence of Generation 'Z', students' perspectives, and adoption tendencies on the rate of utilization of chatGPT. Moreover, the study identified the primary elements that have the greatest influence on students' usage of ChatGPT. The authors do an empirical analysis using a structural equation model (SEM) through Amos version 24. This study exclusively focuses on university students, yet it might yield significant findings if we also include academics. The study discovered a direct relationship among all variables. The views of students, Generation Z, and adoption tendencies all have a positive impact on chatGPT usage rates. Generation 'Z' had the greatest impact on the utilization of chatGPT among university students out of all three independent variables. This study aims to elucidate the prevailing patterns in the utilization of technology, specifically chatGPT. The scope of this study was limited to students who were specifically enrolled in public universities. Future research could investigate the demographics of students attending private universities, specifically focusing on those in the twelfth grade and academicians.

Keywords: ChatGPT, Generation 'Z', Student's view, Adoption tendency, Usage rate of chatGPT.

1. Introduction

A buzzword has been titled like neologism, describing the rapid improvisation of technological eras in the 21st century rapped up by "Fourth Industrial Revolution," "4IR," or "Industry 4.0." The intelligence of humans and animals has almost been replaced by machines or software described as artificial intelligence (AI). ChatGPT (Chat Generative Pre-trained Transformer) is a language-based chatbot introduced and marketed by Open AI on November 30, 2022, and right from its inception, it allows adopters to refine language-based length, style, and format considering successive attempts at replies that create the true sense of live conversation. Given its capacity to generate substantial amounts of text and facilitate content creation, it has garnered considerable popularity as a pedagogical tool for both instruction and acquisition (Hassani et al., 2020; Korteling et al., 2021; Shin and Shin, 2022; Memarian & Doleck, 2023; Baidoo-Anu and Ansah, 2023; Rasul et al., 2023; Pan et al., 2023). Consequently, there has been a burgeoning fascination with ChatGPT beyond the confines of the computer science field, as scholars from many academic backgrounds are delving into its prospective utility (Sohail et al., 2023; Amini and Javid, 2023). The impact of AI models, particularly the notable potential applications of ChatGPT in the field of education, has elicited a range of feelings among educators (Grassini, 2023; Sohail et al., 2023). The Gen Z population, similar to previous generations such as the Silent and Baby Boomer cohorts, as well as Generation X (Gen X) and Generation Y (also referred to as Millennial), exhibits distinctive characteristics that have been influenced by advancements in information and communication technologies, societal and cultural changes, and economic instability (Chan & Lee, 2023). Generation Z, specifically defined as the I-generation, net-gen, and digital natives, includes those who were born during the period spanning from the mid-1990s to the late 2010s (Turner, 2015). A significant number of individuals belonging to Generation Z have developed a strong emotional connection to the Internet. The survey revealed that over 90% of participants, who were between the ages of 13 and 17, expressed feelings of distress at the prospect of losing their Internet connection as a form of punishment (Palley, 2012). ChatGPT fuled up at their burning fire, introducing diversified features by considering the unique ideals and experiences of Generation Z

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in the age of digital media and the potential for this generation to shape and implement new forms of social activism (Turner, 2015; Boggs et al., 2023). Younger people exhibit a greater inclination towards adopting technology, but as they age, their tendency to embrace technology decreases due to the formation of deeply ingrained belief systems that are resistant to change, established through their accumulated experiences (Magotra et al., 2016). Several outcomes were revealed through the outstanding work done by researchers in this ChatGPT field, like: the survey finishes with ChatGPT research prospects; understanding and overcoming ChatGPT's problems will lead to more trustworthy conversational agents in the future (Nazir & Wang, 2023); and another study was made for: Conversational AI model ChatGPT has gained traction in the realm of digital marketing, providing businesses with a potent instrument for customer interaction and brand promotion (Sharma et al., 2023). The study examines the utilization of ChatGPT among students in the UAE, focusing on their perspectives, apprehensions, and perceived ethical considerations (Farhi et al., 2023). A lot of studies were conducted on Generation Z. Generation Z consumers' mobile phone/gadget addiction is rising with social media, and their behavior has changed drastically (Sharma et al., 2023), and another analysis delves into the significant role that technology plays and examines its impact on the development of prosocial interests among individuals belonging to Generation Z (Martinez-Gonzalez et al., 2021).

To the best of our current understanding, there is no existing study that comprehensively examines both the broad field and specific area of chatGPT and Generation Z within a unified framework (Hadi Mogavi et al., 2023). Since its start in November 2022, there have been limited studies conducted on the subject of chatGPT. There is a lack of empirical evidence about the study of the population of Bangladesh. So, we examined several Bangladeshi public university students who are part of generation Z to explore how socio-demographic and inter-personal characteristics, including student views and adoption tendencies, affect the usage rate of chatGPT. The study aimed to determine the correlation and influence of Generation Z, students' perspectives, and adoption tendencies on the usage rate of chatGPT.

2. Review of Literature

2.1 ChatGPT technology

ChatGPT was publicly launched on the last day of November 2022 as an advanced AI tool that quickly gained a remarkable number of subscribers, topping one million within the first seven days (Caldarini et al., 2022). ChatGPT understands and analyzes natural language, generating precise and polished responses with the application of advanced deep learning methods (Susnjak, 2022). Shahriar and Hayawi (2023) found that, although Google and Meta have created their own language frameworks, ChatGPT has maintained its position as the most widely used one. According to Quintans-Júnior et al. (2023), ChatGPT is built upon a transformative architecture. ChatGPT has a crucial feature that allows it to learn from user feedback, which is used to train and modify the system. Human AI trainers play a role in this process by engaging in conversations that involve both the virtual assistant and users. In addition, AI instructors offer written guidance to assist the system in enhancing the effectiveness of composing proposals, resulting in an interactive format (Farhi et al., 2022). ChatGPT is revolutionizing human-technology interaction and leading the path towards a future of sophisticated, conversational artificial intelligence (Mijwil et al., 2023; Rudolph et al., 2023).

2.2 ChatGPT in higher education

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GenAI technologies, such as ChatGPT, have the capacity to revolutionize higher education by providing opportunities to improve learning, instruction, and student involvement (Hu, 2023). The creation of AI-powered virtual tutors that offer students immediate, tailored assistance and evaluation on diverse topics is a noteworthy advancement in education (Celik et al., 2022). ChatGPT can enhance peer cooperation by facilitating connections between students with various backgrounds, interests, and experiences. As an illustration, it can be incorporated into platforms for interaction, like forums and chat rooms, to promote the exchange of ideas, the collective resolution of problems, and collaboration. This improved connectivity has the potential to foster the growth of a more comprehensive and vibrant learning community. ChatGPT can aid instructors in creating course materials for higher education, including reviews, quizzes, and discussion prompt fields (Sharma et al., 2023). Chen et al. (2023) conducted a review on AI in education employing a method of qualitative investigation. They discovered that AI systems have facilitated the adaptation and individualization of curriculum and lesson plans based on students' requirements, resulting in enhanced learning experiences and overall educational excellence. In their 2023 study, Baidoo-Anu and Owusu Ansah (2023) examined the prospective advantages of ChatGPT in the context of education. ChatGPT has several benefits, such as individualized learning, interactive learning promotion, and the ability to give formative assessment for teaching and learning, along with continuous feedback. Halaweh (2023) emphasized the conscientious utilization of ChatGPT in the field of education and put-up tactics to guarantee ethical and efficient use of the technology.

2.3 Generation Z and chatGPT usage

The Gen Z people, like predecessors comprising the Silent and Baby Boomer generations, as well as Generation X (Gen X) and Generation Y (also identified as Millennial), possess distinct features that have been influenced by advancements in technological innovations, changes in society and culture, and economic instability (Shorey et al., 2021). Gen Z, encompassing individuals born from 1995 to 2012, is the maiden generation to be raised in an era of uninterrupted virtual communication through social media and technology, leading to a predominant inclination towards digital platforms and a strong affinity for technology (Puiu, 2017).

Gen Z students, who have been immersed in computers and the internet since childhood, are inclined to readily adopt and accept new technological developments like GenAI and ChatGPT. Furthermore, the Gen Z respondents displayed a positive outlook regarding the prospective advantages of GenAI in higher education, such as improving productivity, efficiency, and individualized learning. Moreover, Gen Z students have indicated their intention to utilize ChatGPT for diverse educational objectives, including gathering and reinforcing knowledge, language acquisition, and writing assistance. This aligns with prior studies that indicate their appreciation for technology in augmenting their learning endeavors (Hernandez-de-Menendez et al., 2020). Marshall and Wolanskyj-Spinner (2020) stated that Gen Z students possess qualities such as being proactive in solving problems and being self-directed in their learning. These characteristics make them particularly well-suited to embracing Gen AI, specifically ChatGPT.

Gen Z pupils anticipate that their educational encounters will be propelled by technology and directly applicable to real-life situations. The individuals prioritize pragmatic, dynamic, experiential learning encounters that incorporate technology and equip them for the labor market (Schwieger and Ladwig, 2018). It has been observed that students belonging to the Gen Z and Millennial generations have developed a greater ability to learn independently, depending on

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technology to resolve issues and acquire knowledge. The adoption of autonomous instruction and technological usage may impact the design and implementation of educational programs targeting the engagement and support of these generations (Szymkowiak et al., 2021).

H_1. Generation 'Z' has a positive influence on the usage rate of chatGPT.

2.4 Student's views and chatGPT usage

ChatGPT has demonstrated outstanding proficiency across various domains, including generating cohesive content and essays, functioning as a chatbot, deciphering languages, providing responses to inquiries, and aiding in programming code. ChatGPT can help students with challenging difficulties, essay writing, and topic understanding, speeding up their learning. ChatGPT can also help students learn programming by answering questions (Rahman and Watanobe, 2023). A majority of college students (51%) see utilizing artificial intelligence (AI) programs such as ChatGPT to finish coursework and tests as an act of academic dishonesty. 20% of the respondents disagreed, while the rest remained neutral. According to the survey, 43% of college students in general reported having utilized AI tools such as ChatGPT. Among this group, half of them admit to relying on these tools for completing projects or tests. According to this statistic, 20% of college students acknowledge using AI to finish their school assignments. The majority of students who have utilized AI applications reported doing so for personal endeavors, driven by curiosity, or for recreational purposes (Nietzel, 2023). Xiong et al. (2021) conducted a study that investigated students' attitudes towards a chatbot used in a language learning environment. The study revealed that students exhibited a favorable disposition regarding the virtual assistant and regarded it as a valuable instrument for acquiring language skills. In accordance with Adiguzel et al. (2023), ChatGPT provides several chances to learners, including the improvement of inner learner drive, promoting a deeper grasp of topics, and the evolution of competence. According to the current investigation (Zhu et al., 2023), ChatGPT utilization can enhance learning experiences by giving individualized support, facilitating access to knowledge, and boosting critical thinking abilities. Advocates contend that ChatGPT can serve as a pragmatic instrument for students to enhance their writing skills, inquiry, and problem-solving proficiencies, provided it is employed properly.

H_2: Student's view has a positive influence on usage rate of chatGPT.

2.5 Technology adoption tendency and chatGPT usage

The inclination to embrace ChatGPT pertains to the extent to which a user considers the technology valuable and easy to use, as well as their readiness to adopt and utilize it for decision-making objectives (Turja et al., 2020). The term "actual use of ChatGPT" pertains to the degree to which individuals in various domains have employed the technology for the purpose of making decisions. The successful adoption of technology relies on the users' intention to utilize it and their subsequent actual usage. Users may fail to implement technology due to several factors, including time constraints, limited money, insufficient technical expertise, or unfavorable past encounters with the technology itself (Yan et al., 2021). Previous studies have confirmed a direct relationship between the intention to utilize technology and the actual usage of it, suggesting that individuals who have the intention to use technology are more inclined to really use it (Turja et al., 2020). According to a study by Turja et al. (2020), users' intention to use robots as supportive social agents was a significant predictor of their actual usage. Furthermore, a study conducted by Laumer et al. (2019) revealed that the users' inclination to utilize chatbots for diagnosing diseases had a

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direct impact on their actual usage of the chatbot. Therefore, we postulated that the users' intention to utilize ChatGPT would have a beneficial impact on their effective utilization of the technology.

H_3: Adoption tendencies has a positive influence on usage rate of chatGPT.

2.6 Conceptual Framework

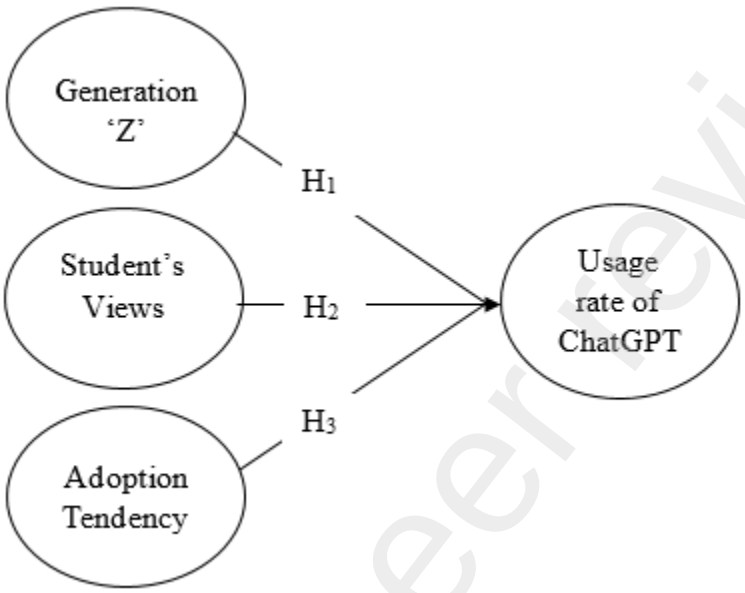

Figure 1: Conceptual Framework

3. Methodology of the study

The utilization of quantitative technique enables the measurement of specific features through the implementation of a systematic data collection approach, encompassing a substantial number of sample representatives. Consequently, the obtained results may be readily and accurately extrapolated to the entire population (Creswell, 2014). The inherent categorization or standardization of quantitative measures implies that quantitative methods possess utility in the identification of concealed patterns and relationships. The revelation of these veiled associations can prove valuable in the identification of novel and unforeseen mechanisms (McEvoy & Richards, 2006). The questionnaire was designed using literature support from multiple published articles (Wiastuti et al., 2020; Yoganathan et al., 2021; Haleem et al., 2022; Farhi et al., 2023).

3.1 Sampling procedure

Based on the research conducted by Hair et al. (2010), it is recommended that the sample size for a study similar to the current one should be a minimum of five times greater than the total number of questionnaire items. Sample sizes ranging from 30 to 500 are generally considered suitable for most research endeavors. In the context of multivariate research, particularly when doing multiple regression analyses, it is recommended that the sample size be significantly larger than the number of variables under investigation, ideally by a factor of at least ten or more (Sekaran, 2003; Sekaran and Bougie, 2016). Therefore, 307 participants were selected using a non-probabilistic convenience selection method to serve as the study's sample size. Different public universities of Bangladesh were selected as the study's target institutions, and data were collected from them

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using a Google form. In the case of data collection, there was a clear statement regarding the purpose and use of the data. In the questionnaire, it is clearly stated that the responses from each respondent will be used for research purposes and that there will be no invasion of privacy. Based on the statement, the respondents agreed and shared their opinion. So all participants gave their informed consent for inclusion before they participated in the study.

3.2 Analysis Technique

The present discourse aims to undertake an analysis of the subject matter at hand. Deductive quantitative tools, such as structural equation modeling, can be employed to elucidate and illustrate various aspects of the basic theory. (Brown et al., 2020; Ford et al., 2018). The researchers utilized a five-point Likert scale that encompassed both multiple choice and multi-point scales. The data collected from the participants' responses underwent statistical analysis using SPSS version 25 and Amos version 24.

4. Empirical Analysis

Table 1: Demographic profile of the respondents

Particulars		Frequency	Percentage
Gender	Male	157	48.9
	Female	150	51.1
	16-20 Years	85	27.7
Age	21-25	221	72.0
	26-30	1	0.3
Study Level	Graduation	299	97.4
	Post-Graduation	8	2.6
	Science	87	28.3
Study Background	Business	198	64.5
	Humanities	22	7.2

Table 1 depicts the demographic profile of the participants of the entire sample, 48.9% identified as male, while 51.1% identified as female. The majority of respondents, comprising 27.7%, fall within the age range of 16-20 years and 72.0% fall within the age range of 21-25 years, while 97.4% of the respondents have attained a graduate degree. The study found a limited number of age group as the study conducted on the generation ‘Z’ peoples. The responses obtained for this study were collected from individuals with backgrounds in science, business, and humanities. The majority of the respondents, comprising 64.5% of the total sample, belonged to business background.

Table 2: Standardized estimates, and reliability statistics

Variables	Item Code	Factor Loading Value	CR	AVE
Generation ‘Z’	GEN1	0.70	0.92	0.69
	GEN2	0.82		
	GEN3	0.80		
	GEN4	0.93		
	GEN5	0.89		
	SV1	0.89		
	SV2	0.89		

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Student's Views	SV3	0.84	0.92	0.70
	SV4	0.72		
	SV5	0.82		
Adoption Tendency	AT1	0.77	0.89	0.62
	AT2	0.86		
	AT3	0.73		
	AT4	0.83		
	AT5	0.72		
ChatGPT Usage	CGU1	0.77	0.90	0.64
	CGU2	0.79		
	CGU3	0.74		
	CGU4	0.89		
	CGU5	0.80		

Table 2 clearly displays the loading value of all assessment items. The loadings value should be higher than 0.60 which indicated a strong association among items and factors (Jaman et al., 2023; Babu et al., 2024), as well as a loading higher than 0.70 implies a good correlation (Hair et al., 2014; Ab Hamid et al., 2017).The outcomes showed that the factor loadings were significantly higher than the recommended cutoff value of 0.70. The CR for all constructs are above 0.89 which must be more than 0.70 to consider the reliability statistics as accepted (Hamid et al., 2017). (AVE values also varied from 0.62 to 0.70 where the cut off value for AVE is 0.50 (Hair et al., 2010).

Table 3: Discriminant validity and model fit indices

Constructs	**Mean**	**SD**	**1**	**2**	**3**	**4**
Generation 'Z'	4.13	0.61	**0.829**			
Student's View	3.94	0.83	0.041	**0.835**		
Adoption Tendency	3.80	0.81	0.074	0.151	**0.785**	
Usage Rate of ChatGPT	4.10	0.65	0.118	0.297	0.118	**0.800**

Indices	**Model Fit Obtained Value**	**Recommended Value**	**Reference**
CMIN/df	2.30	<3	Hair at al., 2010
GFI	0.90	≥0.80	Doll et al., 1994
AGFI	0.86	≥0.80	Doll et al., 1994
NFI (Delta 1)	0.93	≥0.90	Hair at al., 2010
IFI (Delta 2)	0.96	≥0.90	Hair at al., 2010
TLI (rho2)	0.95	≥0.90	Hair at al., 2010
CFI	0.96	≥0.90	Hair at al., 2010
RMSEA	0.06	≤0.08	Browen & Cudeck, 1993

Note: **Bold** diagonal numbers are the square roots of AVE. Source: SEM-Amos and SPSS output

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Table 3 shows that indicates of CMIN/df model fit obtained value 2.30 and recommended value is <3. Similarly GFI 0.90, AGFI 0.86 and recommended value ≥0.80. Besides that the NFI, IFI, TLI, CFI, and RMSEA value meet the recommended level to consider the model as a best fit. So, all indicates are fully fit according to the recommended value.

Table 4: Summary of results (Path Analysis)

Hypothesized Paths			Estimate (β)	S.E.	ρ	Result
Generation 'Z'	→	Usage Rate of ChatGPT	0.835	0.052	0.000***	H_1 Accepted
Student's View	→	Usage Rate of ChatGPT	0.456	0.039	0.000***	H_2 Accepted
Adoption Tendency	→	Usage Rate of ChatGPT	0.307	0.026	0.002**	H_3 Accepted

Note: *** $p < 0.001$, ** $p < 0.05$. Source: SEM-Amos output.

Table 4 shows the hypothesized paths, parameter standardized β values, standardized errors (SE), p values, and acceptance or rejection of the hypotheses. The quality of association among constructs was assessed by inspecting their respective standardized path coefficients (β values) and significance values (ρ values). The results supported 3 of 3 hypotheses. The usage Rate of ChatGPT is significantly predicted by Generation 'Z' ($\beta = 0.835$, $\rho < 0.001$) and the H_1 is Accepted. Student's View ($\beta = 0.456$, $\rho < 0.001$), and Adoption Tendency ($\beta = 0.307$, $\rho < 0.05$) have a significant impact on Usage Rate of ChatGPT, indicating acceptance for hypotheses H_2 and H_3.

5. Result Discussion

The objective of this study is to examine the utilization frequency of ChatGPT among university students for the purpose of addressing their academic assignments. In order to ensure the study's effective completion and trustworthiness, we include both male and female students, with 48.9% being male and 51.1% being female. The ratio is nearly equal, with a close approximation of 1:1. Furthermore, the study includes students from many academic disciplines, such as science, business, and the humanities, as indicated in Table 1. This is an excellent indication of the sample collection. So, the sample selection and methodology of this research study are carefully planned and appropriately connected with the research objectives. The reliability statistics and model fit indices provided in Tables 2 and 3, respectively, show that the model demonstrated a notable degree of reliability and suitability. The data shown in Table 4 show that all hypotheses are valid. This study primarily aims to determine the utilization rate by taking into account the independent variables 'Z' generation, adoption tendency, and student view. Students perceive ChatGPT as a sophisticated writing model that facilitates several activities, including essay composition, language translation, and even poetry creation. They perceive it as a revolutionary instrument that greatly enhances human efficiency and dramatically propels the capabilities of natural language processing (NLP) (Haleem et al., 2022). Generation Z members are characterized by their innovative and pragmatic nature. Crucially, they are recognized as technologically adept digital natives, the initial cohort to be born into a wholly digital realm, and thus, they have matured by substantially engaging with digital technologies (Bernstein, 2015; Euromonitor, 2018). The primary objective of adopting new technology, particularly for Generation Z, is to prioritize convenience (Leung et al., 2021).

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The study indicates that the usage rate of chatGPT is positively influenced by generation 'Z', adoption tendency, and students' views. Students have a favorable perception of utilizing chatGPT to address their academic assignments, which eventually impacts the usage rate. The predicted value of 0.456 supports this conclusion. In addition to these factors, the adoption tendency and the presence of Generation 'Z' students also contribute positively to the usage rate of chatGPT. The estimated values of 0.307 and 0.835 indicate that for every increase of 1 in the adoption tendency and Generation 'Z', the usage rate of chatGPT increases by 0.307 and 0.835, respectively. This method upholds the integrity of academic endeavors, fosters individual growth through independent reasoning, promotes responsible utilization of AI technologies, ensures unbiased evaluation, mitigates excessive dependence on AI, and ultimately yields long-lasting benefits.

5.1 Implication and Conclusion

This study enhances our comprehension of how language models perceive and produce text that resembles human language. This can illuminate the cognitive processes implicated in comprehending and generating natural language. The study indicated that students possess a profound understanding of chatGPT, even when they utilize it to complete their academic tasks. In addition to several benefits, there is a possibility of increasing reliance on AI tools. In that case, the students may allocate a reduced amount of time towards their critical thinking and reasoning analysis. This study provides tangible findings for academics to understand how students react to their assignments. While it is essential to embrace the latest technologies, it does not imply that one should spend less time honing their talents. Moreover, the outcomes can provide valuable insights for formulating regulations and standards pertaining to the utilization of AI-powered tools such as ChatGPT in educational establishments. Additionally, they would assist schools in identifying suitable contexts and limitations for usage, defining ethical boundaries, and establishing frameworks that prioritize students' academic integrity and well-being. Therefore, it can be inferred that the utilization of ChatGPT for educational objectives has both positive and negative implications for educational integrity. Nevertheless, the implementation of practical principles can enhance the process of informed decision-making and policy formulation in educational institutions.

5.2 Limitation and Future Work

The current study was adequately powered by ensuring a balanced ratio of male and female respondents. However, it is important to mention that the sample consisted mainly of students with a business background, indicating a significant representation from this group. Additional research will be conducted with a more in-depth examination of the fields of science, business, and the humanities, ensuring an equal representation of both males and females with a 1:1 ratio. In addition to students' perceptions, it is vital to ascertain the teacher's perspective on students' utilization of chatGPT. This study exclusively focused on students enrolled in public universities. However, future research could explore the students of private universities and those in the twelfth grade.

Competing Interests

The authors declared that there is no known competing financial and non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability Statement

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Data will be made available on reasonable request.

Studies in Human

This research does not involve the use of any human or animal subjects for biological experimentation or the infringement of privacy.

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